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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,223	11/13/2003	Charles W. Wright	87179AEK	8502

7590 06/14/2004  
Paul A. Leipold  
Patent Legal Staff  
Eastman Kodak Company  
343 State Street  
Rochester, NY 14650-2201

EXAMINER

VOLLANO, JEAN F

ART UNIT PAPER NUMBER

1621

DATE MAILED: 06/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/712,223

**Applicant(s)**

WRIGHT ET AL.

**Examiner**

Jean F. Vollano

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/13/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. The instant invention claims no earlier priority. Claims 1-20 are pending.

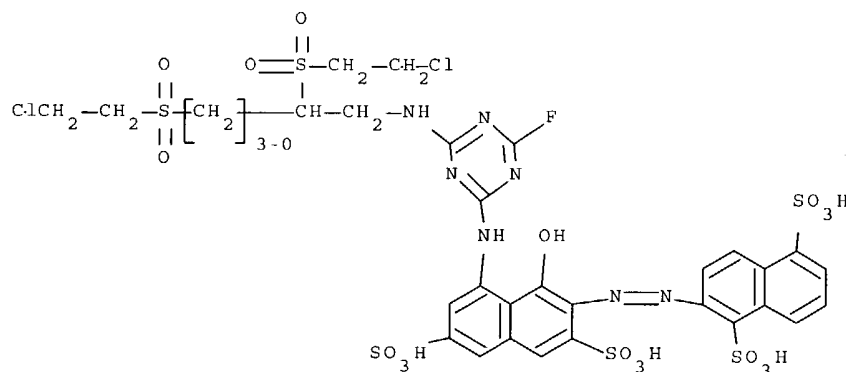
#### *Claim Rejections - 35 USC § 112*

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a process for preparing a sulfone of formula I wherein Z is A, O-A-O or D which are defined in the specification being reacted in the presence of an amide of formula (II) and a reducing agent of thionyl halide with a halogenation reagent which is a thionyl halide, does not reasonably provide enablement for a process using any compound that may be considered a primary alcohol sulfone in the presence of any reducing agent and an halogenation reagent and any amide to prepare any halogenated sulfone. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

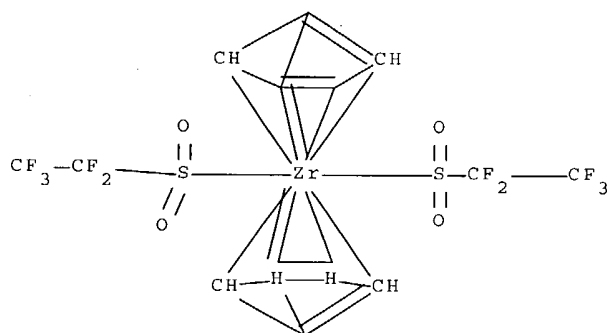
The claims are drawn to a process which uses as a starting material what is described in claim 1 as a multi( primary alcohol sulfone). That in itself so broad as not to be understandable. Does a multi (primary alcohol sulfone) have to have the alcohol and the sulfone in the same linkage or does there have to be a linkage. Does the product which is described as a multi(primary halosulfone) have to have the halogroup next to the sulfone and what is meant by a primary halogroup? The wording is such that the compounds being made and claimed are not even clear.

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The following are some examples of what can be considered as a primary halosulfone or alcohol.

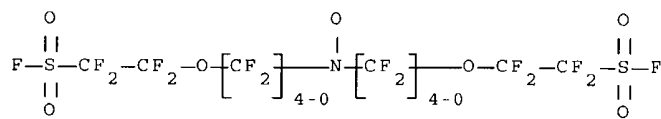


The compound above terminates with a halogroup and has a sulfone which is multi because there are two. The group is held together by a moiety that is complex but there is no requirement that they be held together.

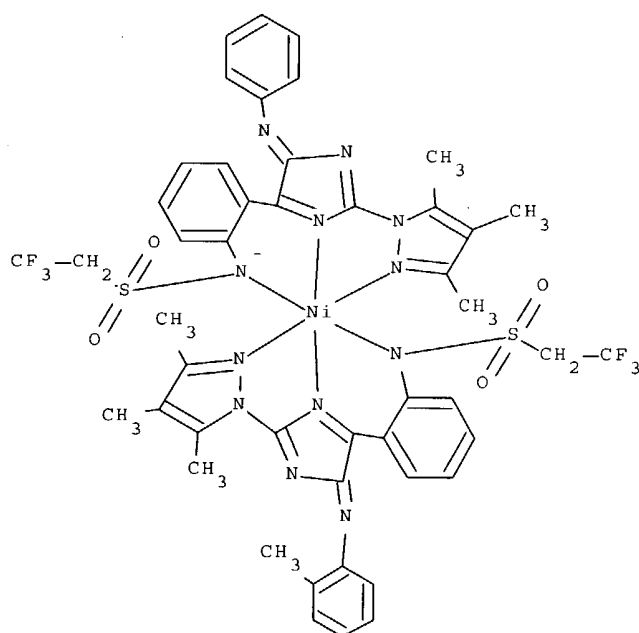


Here is a compound which also fits the final product of being a multiprimary halosulfone. The F is terminal and there are multi sulfones.

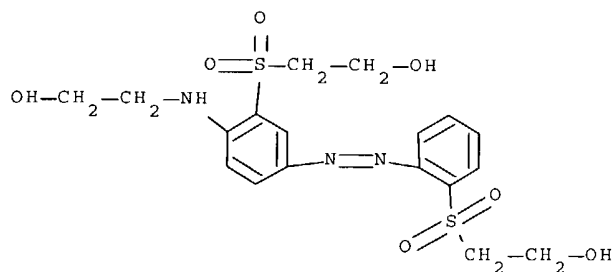
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Here is a multiprimary halo sulfone where the halo group is attached to the sulfone which has a nitric oxide group attached. This still meets the requirements.



Here is another compound that fits the description in claim 1.



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Here is a compound that fits the primary alcohol sulfone but there is a highly reactive N=N moiety holding them together.

These are very few but there are thousands. The examiner searched with an alkyl sulfone which is not a requirement in claim 1 and found over 2000 hits for the halide and 1500 hits for the primary alcohol. If one added all the compounds that could be considered aryl sulfonyl halides and primary alcohols there would be thousands more. Each of these compounds in itself to be prepared or used as a starting material would take undue experimentation to find out what conditions were required just to make sure they would not decompose before the reducing agent and the rest was added. The only compounds that applicant had in his possession at the time of filing appear to be compounds are those of formula I wherein Z is an A, O-A-O and D as defined in the specification. Claiming a process for preparing thousands of compounds using a generic definition of a reducing agent which in itself would lead to experimentation since a reducing agent is relative to what is being oxidized and reduced. For example if one had a solution that contained hydrogen peroxide and permanganate, which are both in their own right oxidizing agents, then only one would be an oxidizing agent and one would be a reducing agent since one would be reduced by the stronger oxidant. Not only is the term relative which would require one of ordinary skill in the art to determine what was exactly being reduced but to make sure that the sulfone product which can be reduced to a sulfide or sulfoxide is not reduced in the process or the product would not be a sulfone. Then there is the halogenation reagent. Potassium fluoride is a halogenation reagent so is HF so is thionyl chloride so are many organometallic halides. There are hundreds of halogenation reagents. Some are strong and some are weak and with the complication of various metallo, porphine, and nitric oxide halo sulfones being prepared

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wherein the halo group could be on a carbon or on the sulfone itself or on a metal for that matter it would take undue experimentation to make and use the process being claimed in the instant invention. The only a suggestion of a thionyl halide for the reducing agent and for the halogenation reagent. If the halogenation reagent were different than the thionyl halide then there would be no guidance as to what would be a suitable reducing agent.

Then there is the amide. Again there are inorganic amides, organometallic amides, organic amides etc. The amide that is found in formula II is the only amide that is mentioned.

This is for the first step and then claim 17 adds an additional step of forming a multivinyl sulfone using a base or bases. Again one has the choice of any base and the base could be such that the vinyl formation would be hindered.

One of ordinary skill in the art knows clearly that when more than one variable is changed in a reaction there is a difficulty in predicting the outcome of the reaction. When two or more variables are changed it is almost impossible have the reaction be repeated successfully. In this scenario there are over 5 variables which can be almost anything and as such it would not take only undue experimentation to perform the process to the scope being claimed it would also be impossible to even search to the scope being claimed. Claim 1 is verging on an omnibus claim. The other claims that have generic claims to one part of the process would also take undue experimentation to perform the process to the scope being claimed.

The scope of the claims is broader than the scope of the enablement and it would take undue experimentation to perform the process to the scope being claimed.

The examiner notes that the claims should be written in a clear and concise manner pointing out the metes and bounds of the instant invention so that one of ordinary skill in the art

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having the claimed invention could perform the invention to the scope being claimed without undue experimentation.

Claims 1 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation of “a multi(primary alcohol sulfone)”. This phrase is confusing as to what are the metes and bounds of that limitation is. Does the sulfone have to be attached to the alcohol? If so how is it attached (e.g. by ionic bonding? By covalent bonding?) Is the primary alcohol attached directly to the sulfone which would make the compound a sulfonic acid? Does the wording mean that there can be two sulfones hydrogen bonded to one another or does the wording mean that they are directly covalently bonded together. Can they be part of a metal salt? The wording is so vague as to not give any idea what the metes and bounds of the moiety being used as a starting material is. The same problem occurs for the phrase multi(primary halosulfone). The same problem occurs in claims 13-17 and 20.

Claim 2 recites the limitation of “Z is an organic radical”. First of all it is unclear why Z is a radical? Is it a free radical with a lone pair of electrons or is it an ionic radical such as a carbonium ion. The term is confusing as to what are the metes and bounds of the term organic radical.

Claim 2 recites the limitation of “Z... having a valence of n where n is 2-6”. It is unclear what exactly is meant by that limitation. Carbon usually is in a +4 valence. Does this mean that there must be 4 SO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH groups around the Z if the Z is a mono carbon? If n is two



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does this mean that the Z is oxygen or sulfur which can have a valence of +2? Also it is unclear what has a valence of +6 and is organic. Only transition metals and metals and non metals of the second row and beyond can expand their octet. Is the claim directed to Phosphorus with an oxidation state of +5 included. If that is so then the term organic is confusing. The claim is confusing as to the metes and bounds of what is being claimed.

Claim 5 recites “the primary alcohol sulfone”. This lacks antecedent basis. The only terminology used previously is multi (primary alcohol sulfone). Is that what this limitation is referring to ?

Claim 10 recites the limitation of wherein “R is a branched or unbranched alkyl group ... or hydrogen. These limitations lack antecedent basis. Claim 9 only does not recite hydrogen groups. Also claim 10 recites an aromatic group. How does an aromatic group differ from an aryl group. If they are the same use the same terminology. If they are not please explain for the record and show support that aromatic is a subset of aryl.

Claim 13 recites “1.0 part amide per part of multialcohol sulfone”. There no antecedent basis for multialcohol sulfone. Also what is meant by per part? Is it per mole or is it per weight or is it per volume? The claim is confusing as to the metes and bounds that are being claimed in the instant invention. Claims 14-15 has the same problem.

Claim 16 recites “the solvent” this lacks antecedent basis.

Also the claim recites the limitation of “wherein the solvent is one that doesn’t appreciably react with the halogenating reagents”. There are some problems here. First the claim refers back to “a halogenating agent” not agent or reagents. Second what are the metes and bounds of the

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terminology of “doesn’t appreciably react with the halogenating..” Does that mean 1% consumption or does it mean 40% reactivity. The term is vague and indefinite as to what the metes and bounds are of the reactivity of the agent is with the solvent ?

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2, 6-17, 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sera et al ( US 4,173,481).

Sera et al exemplify the process for preparing a 1,3 –bis(chloroethylsulfonyl ) –2-propanol by reacting the corresponding hydroxyl ethyl sulfonyl compound with a catalytic amount of a compound and with a reducing agent and a chlorinating agent which is thionyl chloride (see example 2 in column 12-13) In the compound Z would be an organic moiety wherein n is two.

Sera et al exemplifies the process of reacting the chloro compound produced above with a base in acetone to form the vinyl counter part.

Sera et al differs in that the exemplification is for pyridine as the catalyst and the quantities of the catalyst are not exemplified. However Sera et al teaches that an alternative for

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the catalyst could be dimethylformamide which is an amide of formula II wherein R' and R'' are methyl and R is hydrogen. ( see column 5 last 4 lines and column 6 lines 1).

Even though the catalyst is not exemplified it is expressly suggested in the equivalence of pyridine and dimethylformamide as a catalyst. It would have been obvious to one of ordinary skill in the art to have prepared the vinyl compound by the process of Sera and to have used the amide catalyst suggested by Sera with the expectation of success since there is an equivalency taught for the process. It is also within the purview of one of ordinary skill in the art to have optimized the ratio of catalyst to the reactants to optimize the yield and activity. Optimizing a known reactions parameters is not an unobvious modification unless there are unexpected results due to the optimization.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (Ep 0640589) in view of CA:132:194112 and Sera et al ( US 4,173,481).

Kim et al exemplifies a process for preparing vinyl sulfones which have the formula  $(CH_2=CH-SO_2)_nZ$  by reacting  $CHXCH_2SO_2)_n-Z$  where Z is methylene in a weak base including propionates, acetates ext in a solvent of acetone acetonitrile etc. although water is not specifically mentioned acetone is always wet with water and there is no limitation on the amount of water nor is water mentioned in the instant example. The acetone is used from without drying in the example (see example 1 and 2) .

Kim et al differs in that the origin of the dichlorocompound is not taught. One needing the starting material would look to the literature for preparing the dichlorocompound.

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CA:132:194112 in a process for preparing the starting material of Kim et al teaches that the corresponding diol can be reacted in the presence of thionyl chloride in acetone using a catalyst of pyridine. However the catalyst is no an amide.

Sera et al in a similar process for producing dichloro compounds from the corresponding alcohols teaches that pyridine or dimethyl formamide can be used as a catalyst equivalently (column 6, line 1).

It would have been obvious to one of ordinary skill in the art to have used the process of Kim to prepare the vinyl sulfone and to have used the process of CA:132:194112 to have prepared the starting material (i.e. dichlorocompound) for the process of Kim by using the CA reference since CA:132:194112 teaches the exact compound needed for Kim's process. It would have also been obvious to one of ordinary skill in the art to have used a amide or pyridine catalyst since Sera has an equivalency of pyridine and dimethyl formamide in the process of replacing the OH alcohol groups by Cl groups. It would have also been obvious to one of ordinary skill in the art to have optimized the catalyst amount with reference to the reagents to optimize the speed and yield of the reaction.

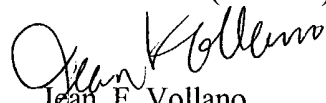
3. CA:102:119627 teaches a process for the preparation of primary sulfonyl chlorides by reacting the corresponding hydroxyethyl sulfonyl compound with thionyl chloride . However no amide is mentioned in the abstract the compounds being made include the ones above in the 103(a) rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean F. Vollano whose telephone number is 571-2720648. The examiner can normally be reached on Monday-Thursday 6:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272- 0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jean F. Vollano  
Primary Examiner  
Art Unit 1621

June 6 2004